APPENDIX G

SOCIO-ECONOMICS

The Economic Significance of Lake Belt Limestone Mining

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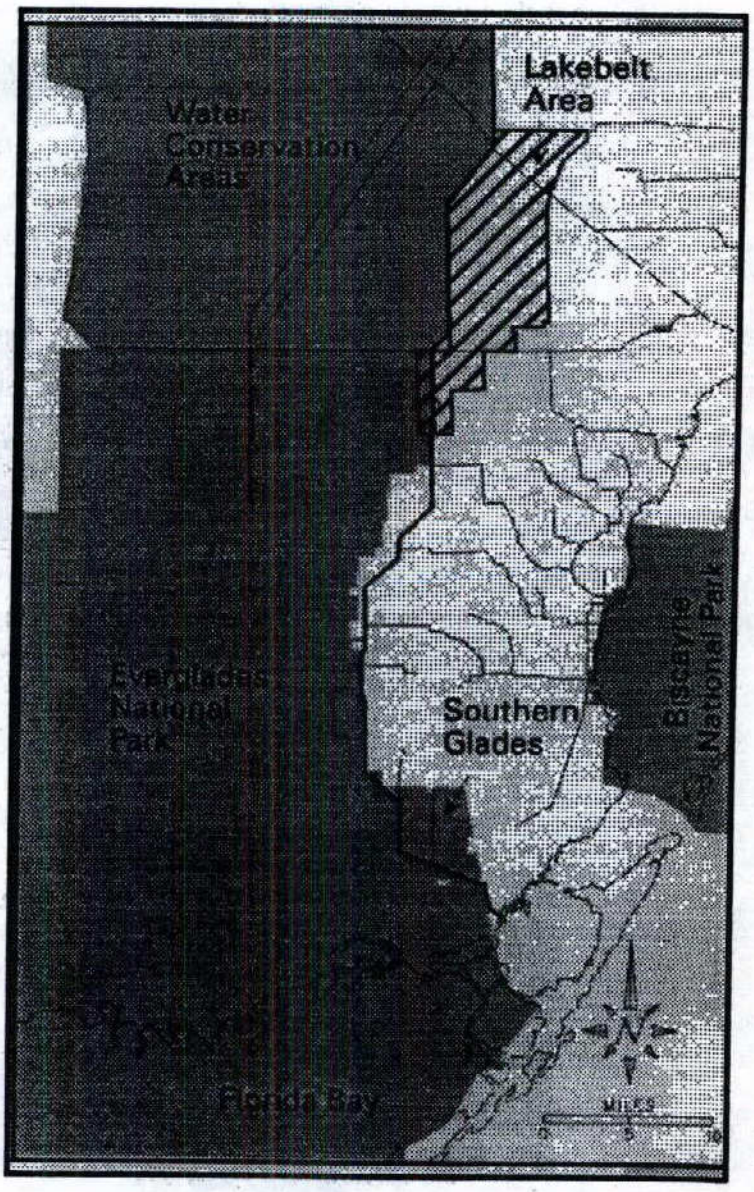
The Lake Belt



The Lake Belt region is an 89 square mile area of western Dade County. It is situated within one of the more environmentally sensitive areas of the state. It is also an area of active limestone mining. Due to the ongoing mining activities within this environmentally sensitive area, the Florida Legislature created the Northwest Dade County Freshwater Lake Plan Implementation Committee (Committee). This committee was charged with the responsibility to develop a plan that:

(a) enhances the water supply of Dade County and the Everglades;

(b) maximizes the efficient recovery of limestone while promoting the social and economic welfare of the community

and protecting the environment; and

(c) educates various groups and the general public of the benefits of the plan.[1]

The mining and processing of crushed limestone is an important source of jobs and income for those employed directly in these activities in addition to those indirectly employed. The mining of crushed stone within the United States is a significant industry both as a means of employment and as a producer of needed products. In 1997 approximately 1.3 billion tons of crushed stone was mined in the United States.[2] This industry directly employed some 42,000[3] workers with a payroll of $888 million.[4] In 1997 the Florida the crushed stone mining industry mined more than 70 million tons.[5] The quantity of crushed limestone mined in the Lake Belt region of Dade County is approximately half of total state production. Limestone mined from the Lake Belt is shown in Table II-1 and

TABLE II - 1

OUTPUT OF CRUSHED LIMESTONE

LAKE BELT 1993 - 97

(000 Short Tons)

Year	Production
1993	26,611,200
1994	32,751,290
1995	34,903,550
1996	35,634,610
1997	36,586,440

SOURCE: Industry Survey 1998.

graphically depicted in Figure II-1. The annual rate of growth of limestone mined from the Lake Belt is 6.5% per year for the period 1993 through 1997. This rate of increase in tons of limestone mined is keeping pace with the dynamic growth of Florida.

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[1] "Northwest Dade County Freshwater Lake Belt Plan: Making a Whole, Not Just Holes," February 1997, page 3.

[2] *Statistical Abstract of the United States, 1997*, page 698.

[3] This datum includes only those employees directly involved in the mining of crushed stone.

[4] *Ibid.* p. 697.

[5] *Florida Statistical Abstract, 1997*, p. 339.

Limestone mining is linked to the manufacture of cement, asphalt, concrete and concrete products. Inasmuch as limestone is an input into these other products, the manufacture of cement, asphalt, concrete and concrete products must be included in any assessment of the economic significance of the crushed limestone industry to the region and the state.

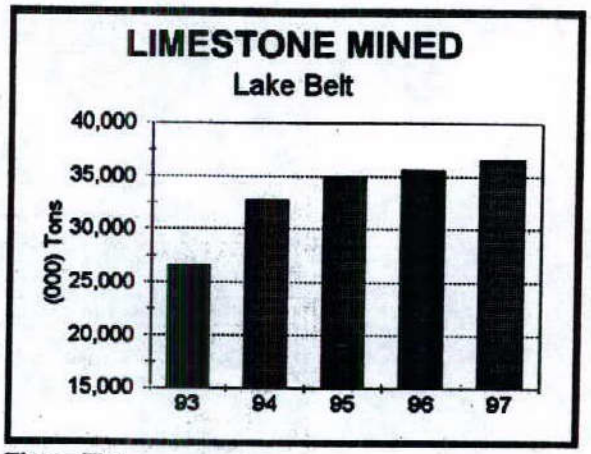

Figure II-1

The rock mined in the Lake Belt region is used for five primary purposes; asphalt aggregate, concrete aggregate, road base, fill, and cement. See Table II-2 and Figure II-2. Road building is a significant use of the limestone mined from the Lake Belt. However, approximately one-half of the limestone mined is used for concrete aggregate. Generally speaking, concrete is used in building infrastructure. Most of our urban environment is built with concrete. Examples of concrete uses are roads and sidewalks, the blocks used to construct homes and smaller buildings, and the poured concrete used to build the larger. The uses of concrete surround us all.

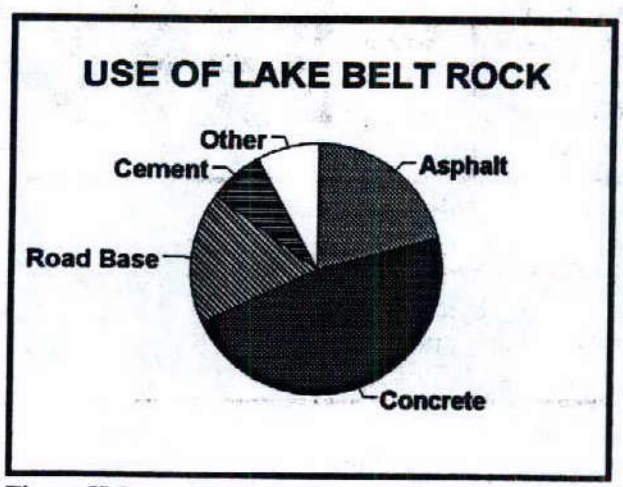

Figure II-2

The limestone mined from the Lake Belt is shipped by rail to as far north as Jacksonville. The Orlando area is also supplied by Lake Belt rock. Thus the limestone mined in this western part of Dade County has statewide significance first in the high portion of total state production accounted for by this small area and second in terms of the portion of the rapidly growing state that derives limestone products from this region.

TABLE II - 2

USE OF LAKE BELT LIMESTONE

1993-1997

USE	Tons	%
Road Base Fill	6,221,842	16.9%
Asphalt Aggregate	7,645,428	20.8%
Other Road	76,654	0.2%
Cement	2,631,410	7.2%
Concrete Aggregate	17,324,100	47.1%
Road Surface Treatment	531,430	1.4%
All Other	2,317,576	6.3%
TOTAL	36,748,440	100.00%

SOURCE: Industry Survey, 1998, and Table II-1.

While consuming only a small portion of total limestone mined (7.2%), another important product made from Lake Belt limestone is cement. Table II-3 and Figure II-3 show the quantity of cement produced from Lake Belt limestone. It is apparent that there has been no change in the quantity of cement produced from Lake Belt limestone. Rather, the additional tons of limestone mined, as shown in Table II-1, have been used primarily for aggregate, both asphalt and concrete.

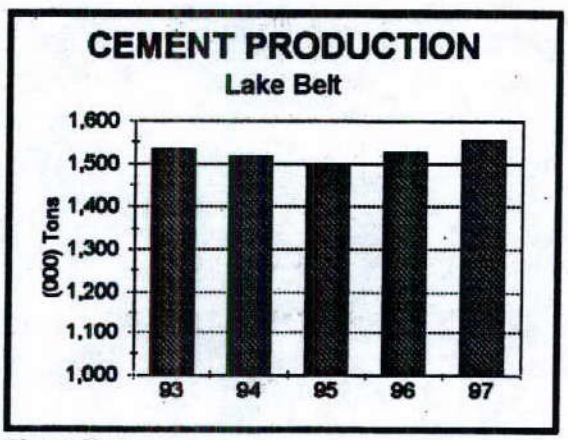

Figure II-3

TABLE II - 3

OUTPUT OF CEMENT

LAKE BELT 1993 - 97

Tons

Year	Production
1993	1,533,177
1994	1,517,058
1995	1,497,670
1996	1,526,000
1997	1,554,118

SOURCE: Industry Survey 1998.

2

Economic Significance

The Supplying of Needed Products

Florida has been growing rapidly. Between 1980 and 1990 the state saw the addition of more than 3 million people to its population -- from 9.7 million to 12.9 million.[1] After 1990 the pace of growth slackened due to the recession of the early 1990's but since economic recovery annual growth has returned to the 300,000 per year range.[2] Approximately 80% of Florida's growth in population is due to net in-migration.[3] From 1980 to 1990 Florida added 1.7 million new housing units,[4] this is a ratio of 1.8 new residents per new home. Since 1990 the average pace of new construction has been 100,000 per year.[5] As with population growth, the pace of construction slowed during the recession and since recovery is now running at a pace of some 125,000 housing unit starts per year.[6] In addition to the homes, millions of square feet of nonresidential construction have been built to provide places for employment, commerce and recreation for the great number of individuals present. Lastly, the state has been adding approximately 1,000 new miles of roads per year.[7] All of this growth requires limestone in order to be accommodated. The most significant impact of Lake Belt crushed limestone mining is the production of goods, primarily building goods, for a growing Florida.

The development of Florida – which is certainly not without its problems – has transformed a

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[1] *Florida Statistical Abstract, 1997*, page 6.

[2] *Ibid.*, page 9.

[3] *Ibid.*, page 48.

[4] University of Florida, *Florida Census Handbook, 1990*, page 115.

[5] *Florida Statistical Abstract, 1997.*, page 69.

[6] *Ibid.*, page 344.

[7] *Ibid.*, page 307.

small and economically deficient state into what will become the third largest state (after California and Texas) and one of the more economically prosperous.[8] At the outset of this century Floridians were among the nation's poorest, with state per capita income at 55% of the nation norm.[9] By 1996 Florida per capita incomes had grown to equal that of the national norm.[10] This rapid growth has been the most significant factor in the demand for crushed limestone and products made from crushed limestone. The significance of the crushed limestone industry of the Lake Belt goes far beyond its local production, for it plays a vital role in the economic development of the state. Additionally, this region of the United States is playing an increasing role in national and international economic development. Therefore, the significance of the Lake Belt crushed limestone industry extends to national and international considerations.

The following section will present data on employment and earnings for the crushed limestone industry, cement and cement products.

Employment and Earnings.

To many the significance of the crushed limestone activity is the employment and incomes it generates within the local economy. These jobs come from the actual mining of the rock but also from associated activities such as sales or administration, and also from the products produced from the mined rock. Each of these is considered in turn.

Crushed Limestone.

In 1997 the crushed limestone activity within the Lake Belt directly employed an estimated 685

TABLE III-1

ESTIMATED EMPLOYMENT IN CRUSHED LIMESTONE
LAKE BELT 1993 - 97

YEAR	Total	Operations	Administrative & Managerial
1993	558	466	91
1994	606	507	99
1995	674	579	96
1996	688	574	113
1997	685	580	106

SOURCE: Industry Survey, 1998.

[8] *Statistical Abstract of the U.S., 1997*, page 35.

[9] See H. S. Perloff, et al, *Regions, Resources and Economic Growth*, Baltimore: Johns Hopkins Press, 1960., p. 650. The 1900 per capita income for Floridians was $112 and $203 for the nation.

[10] *Florida Statistical Abstract, 1997*, page 146. Also see *Statistical Abstract of the U.S., 1997*, page 456.

individuals. These individuals earned wages and salaries of $27.2 million[11]. The details of these figures are presented in Tables III-1 and III-2.

TABLE III-2

EARNINGS OF CRUSHED LIMESTONE EMPLOYEES
LAKE BELT 1993-97
July 1998 = 100

	Total Earnings		Operations		Administrative & Managerial	
YEAR	Current	Adjusted	Current	Adjusted	Current	Adjusted
1993	18,471,098	20,899,823	14,307,051	16,188,255	4,164,047	4,711,568
1994	20,810,469	22,958,918	16,398,847	18,091,846	4,411,622	4,867,072
1995	23,283,168	24,978,989	18,632,979	19,990,106	4,650,188	4,988,883
1996	24,764,444	25,806,161	19,661,920	20,488,999	5,102,524	5,317,162
1997	26,673,589	27,172,160	21,361,471	21,760,751	5,312,118	5,411,410

SOURCE: Industry Survey, 1998.

[11] All financial data are adjusted to the July 1998 base using the Consumer's Price Index.

Cement Manufacture

Approximately eight percent of the crushed limestone mined in the Lake Belt area is used to manufacture cement. The manufacture of cement from this rock directly employed an estimated 291 individuals who earned $10.6 million. These data are contained in Tables III-3 and III-4.

TABLE III-3

ESTIMATED EMPLOYMENT IN CEMENT MANUFACTURE
LAKE BELT 1993-97

YEAR	Total	Operations	Managerial & Administrative
1993	292	225	67
1994	295	226	69
1995	307	235	72
1996	307	237	70
1997	291	227	64

SOURCE: Industry Survey, 1998.

TABLE III-4

EARNINGS OF CEMENT MANUFACTURE EMPLOYEES
LAKE BELT 1993-97
July 1998 = 100

	Total Earnings		Operations		Administrative & Managerial	
YEAR	Current	Adjusted	Current	Adjusted	Current	Adjusted
1993	8,640,500	9,776,621	6,035,000	6,828,529	2,605,500	2,948,092
1994	9,023,200	9,954,745	6,308,200	6,959,451	2,715,000	2,995,294
1995	9,922,700	10,645,416	7,096,000	7,612,835	2,826,700	3,032,582
1996	9,701,100	10,109,177	6,956,200	7,248,813	2,744,900	2,860,364
1997	10,383,200	10,577,279	7,371,000	7,508,776	3,012,200	3,068,503

SOURCE: Industry Survey, 1998.

Concrete Products.

In 1997, an estimated 3,006 individuals were employed in the manufacture of concrete products from Lake Belt mined limestone. Concrete products include block, tiles, and ornamental block, with concrete block being the largest component. These individuals received an estimated $131 million in wages and salaries. The details of these estimates are contained in Tables III-5 and III-6.

TABLE III-5

ESTIMATED EMPLOYMENT IN CONCRETE PRODUCTS MANUFACTURE

LAKE BELT 1993-97

YEAR	Total	Operations	Managerial & Administratve
1993	2,776	2,133	643
1994	2,835	2,172	663
1995	2,760	2,121	639
1996	2,806	2,117	689
1997	3,006	2,325	681

SOURCE: Industry Survey, 1998.

TABLE III-6

EARNINGS OF CONCRETE PRODUCTS EMPLOYEES

LAKE BELT 1993 - 97
July 1998 = 100

	Total Earnings		Production		Managerial & Administrative	
YEAR	Current	Adjusted	Current	Adjusted	Current	Adjusted
1993	120,555,866	136,407,502	84,349,980	95,440,980	36,205,886	40,966,522
1994	122,131,192	134,739,878	85,167,365	93,959,947	36,963,827	40,779,931
1995	120,918,472	129,725,526	84,328,406	90,470,435	36,590,066	39,255,091
1996	113,830,850	118,619,146	79,219,163	82,551,518	34,611,687	36,067,628
1997	128,666,056	131,071,029	89,872,629	91,552,491	38,793,427	39,518,538

SOURCE: Industry Survey, 1998.

Sales Forces and Independent Operators.

In 1997, an estimated 182 individuals were engaged in the sale of stone and stone related products mined in the Lake Belt. These individuals received an estimated $11.7 million in wages and salaries. The details of these estimates are contained in Tables III-7 and III-8.

TABLE III-7

ESTIMATED EMPLOYMENT IN SALES
LAKE BELT 1993-97

Year	Total	Sales	Managerial & Administratve
1993	156	132	24
1994	162	137	25
1995	169	143	26
1996	176	149	27
1997	182	154	28

SOURCE: Industry Survey, 1998.

TABLE III-8

EARNINGS OF SALES EMPLOYEES
LAKE BELT 1993 - 97
July 1998 = 100

	Total Earnings		Sales		Managerial & Administrative	
YEAR	Current	Adjusted	Current	Adjusted	Current	Adjusted
1993	9,999,920	11,314,788	7,763,152	8,783,912	2,236,768	2,530,876
1994	10,309,915	11,374,299	8,084,403	8,919,028	2,225,512	2,455,271
1995	10,619,976	11,393,478	8,457,530	9,073,531	2,162,446	2,319,947
1996	11,074,940	11,540,807	8,830,656	9,202,118	2,244,284	2,338,690
1997	11,529,884	11,745,396	9,151,907	9,322,971	2,377,977	2,422,425

SOURCE: Industry Survey, 1998.

There are an estimated 2,000 independent operators that derive their employment from Lake Belt limestone mining. No exact count can be made simply because these operators are, in fact, independent. The number of independent operators shown in Table III-9 is derived from industry

TABLE III-9

ESTIMATED TOTAL EMPLOYMENT AND EARNINGS INDEPENDENT CONTRACTORS

LAKE BELT 1993 - 97

July 1998 = 100

YEAR	Employment	Earnings	Average
1993	2,000	52,514,466	26,257
1994	2,000	54,002,730	27,001
1995	2,000	55,597,299	27,799
1996	2,000	56,872,954	28,436
1997	2,000	57,936,000	28,968

SOURCE: Industry Survey, 1998.

estimates. Because no income data are available for these individuals, they will be assigned the average earned income for Dade County from $26,257 in 1993 to $28,968[12] in 1998. This method results in estimated earnings of $57.9 million by independent contractors.

Other Linked Activities.

Any industry, such as limestone mining, stimulates a number of other economic activities such as the supply of office equipment, the provision and repair of equipment, etc. These economic activities are directly linked to the primary activity. However, it is very difficult to obtain detailed data about these linked activities even though their existence is non-controversial. For purposes of this analysis, it will be taken that other linked activities are equal to 15% of the sum of mining, cement and concrete products, independent operators, and sales. These other linked activities are included in Table III-10.

[12] *Florida Statistical Abstract, 1997*, page 202.

Direct Employment and Earnings.

TABLE III-10

TOTAL DIRECT EMPLOYMENT

LAKE BELT 1993-97

YEAR	Mining	Cement	Concret Product	Independe Operator	Sales	Other Linke	Total
1993	558	292	2,776	2,000	156	867	6,649
1994	606	295	2,835	2,000	162	885	6,783
1995	674	307	2,760	2,000	169	887	6,797
1996	688	307	2,806	2,000	176	896	6,873
1997	685	291	3,006	2,000	182	925	7,089

SOURCE: Industry Survey, 1998.

The five components of the Lake Belt limestone industry, including linked activities, collectively constitute total employment of 7,089 individuals. In 1997, they earned an estimated $265 Million. Direct employment and earnings include other linked activities equal to fifteen percent of the sum of these industry resources. Tables III-10 and III-11 show these components and totals.

TABLE III-11

TOTAL DIRECT EARNINGS

LAKE BELT 1993 - 97

1998=100

YEAR	Mining	Cement	Concrete Products	Independen Operators	Sales	Other Linked	Total
1993	20,899,823	9,776,621	136,407,502	52,514,466	11,314,788	25,115,256	256,028,457
1994	22,958,918	9,954,745	134,739,878	54,002,730	11,374,299	25,636,680	258,667,250
1995	24,978,989	10,645,416	129,725,526	55,587,299	11,393,478	25,694,616	258,035,325
1996	25,806,161	10,109,177	118,619,146	56,872,954	11,540,807	25,955,328	248,903,573
1997	27,172,160	10,577,279	131,071,029	57,936,000	11,745,396	26,795,400	265,297,264

SOURCE: Industry Survey, 1998.

Indirect Economic Activity.

Any primary economic activity sets off forces which generate secondary economic activity. This is commonly known as the "ripple effect." In other words, employees who derive their income from the direct activity (mining, cement and concrete products and linked activities), spend that income within the local economy. This second-round of spending generates economic activity within the so-called support, local or non-basic sector of the economy.[13] The essence of this effect is that an initial expenditure is multiplied throughout the economy. In the short run--five years or less--this multiplication can be very great if growth of the primary activity necessitates in-migration of new employees. Such in-migration results in a demand for new housing and other major consumer expenditures and these factors are subject to multiplication within the local economy. Once these have been absorbed (i.e., such new housing has been constructed), the multiplier falls to a lower level. Within Dade County the short-term multiplier is frequently in excess of three.[14] Over time, this short-term or impact multiplier would be expected to decline to approximately two.[15] This means that for each employee directly employed in the industry, there is one employee indirectly employed. Inasmuch as this study is dealing with the longer term view of this industry, the lower multiplier will be used.

The indirect levels of employment and earnings resulting from limestone mining and associated activities are set out in Table III-12.

TABLE III-12

ESTIMATED INDIRECT EMPLOYMENT AND EARNINGS

LAKE BELT 1993 - 97

July 1998 = 100

YEAR	Employment	Earnings	Average
1993	6,649	$174,576,465	$26,257
1994	6,783	$183,152,960	$27,001
1995	6,797	$188,955,761	$27,799
1996	6,873	$195,429,689	$28,436
1997	7,089	$205,362,842	$28,968

SOURCE: Industry Survey, 1998.

NOTE: The average earnings used are the Dade County average wage and salary income for 1995, adjusted by 2% per see. See Florida Statistical Abstract, 1997, pages 173 and 219.

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[13] In technical terms the "support sector" is known as the non-basic sector. See C.M. Tiebout, The Community Economic Base Study (Washington: Committees for Economic Development, 19).

[14] See J.C. Nicholas, The Broward Economy, (Fort Lauderdale: Economic Development Council of Broward County, 1980).

[15] Metropolitan Dade County Planning Department.

Total Economic Impact

The primary economic significance of the limestone rock mining industry is that this material is vital to the Florida construction industry and to Florida system of transportation. Table III-13 provides a summary of the total economic impact, both direct and indirect, of Lake Belt limestone mining activities.

TABLE III-13
TOTAL ECONOMIC IMPACT
LAKE BELT 1993 - 97
July 1998 = 100

YEAR	Employmen	Annual Change	Earnings	Annual Change
1993	13,297		$430,604,922	
1994	13,566	2.0%	$441,820,210	2.6%
1995	13,595	0.2%	$446,991,085	1.2%
1996	13,745	1.1%	$444,333,262	-0.6%
1997	14,179	3.2%	$470,660,106	5.9%
Total Change	881	6.6%	$40,055,184	9.3%
Annual Average	176	1.3%	$8,011,037	1.8%

SOURCE: Industry Survey, 1998.

While providing much of the state of Florida with needed products, the Lake Belt limestone mining industry also adds 14,179 jobs with a payroll of $470 million to the local economy. Thus the significance of this industry is in both the production of a market demanded product while also generating substantial employment and income.

Property Taxes

Another important role that any industry plays is that of a taxpayer. Businesses pay a wide variety of taxes. Table III-14 sets out the real property taxes paid top Dade County taxing authorities. Table III-15 contains personal property tax payments and Table III-16 sums the two.

TABLE III - 14

PAYMENT OF REAL PROPERTY TAXES

LAKE BELT 1993 - 97

YEAR	Total	Dade County	School Board	Water Management District
1993	2,823,753	1,825,974	931,161	66,619
1994	2,825,558	1,804,802	967,213	53,542
1995	2,779,992	1,752,218	970,590	57,184
1996	2,817,846	1,789,737	968,720	59,389
1997	2,850,966	1,814,785	975,656	60,525

SOURCE: Industry Survey, 1998.

TABLE III - 15

PAYMENT OF PERSONAL PROPERTY TAXES

LAKE BELT 1993 - 97

YEAR	Total	Dade County	School Board	Water Management District
1993	2,459,716	1,590,569	811,116	58,031
1994	2,685,891	1,715,592	919,404	50,896
1995	3,501,249	2,206,823	1,222,405	72,021
1996	3,562,384	2,262,626	1,224,678	75,081
1997	2,888,517	1,838,688	988,507	61,322

SOURCE: Industry Survey, 1998.

TABLE III - 16

TOTAL PROPERTY TAXES PAID

LAKE BELT 1993 - 97

YEAR	Total	Dade County	School Board	Water Management District
1993	5,283,469	3,416,543	1,742,277	124,650
1994	5,511,449	3,520,394	1,886,617	104,438
1995	6,281,242	3,959,041	2,192,995	129,205
1996	6,380,230	4,052,362	2,193,398	134,470
1997	5,739,483	3,653,472	1,964,163	121,847

SOURCE: Industry Survey, 1998.

Personal property taxes are a major source of local tax receipts.[16] Tax payments of personal property taxes are estimated to approximate real property taxes. In the survey conducted as a part of this study a sub-sampling was conducted to establish a ratio between real and personal property taxes and that ratio was used to project personal property taxes paid as set out in Table III-15. The result is an estimated payment of $5,739,483 in local taxes to Dade County taxing authorities.

[16] Section 192.001(11)9d) defines personal property as "all goods, chattels, and other articles of value . . . capable of manual possession and whose chief value is intrinsic to the articles itself." The personal property of individuals is exempt from taxation thus the personal property tax falls primarily on businesses.

3

Methodology

The methodology employed was to distribute a written questionnaire to Lake Belt mining interests that constitute approximately 90% of mining and related activities within the Lake Belt. The completed questionnaires sent to the author individually and the author aggregated those data. The data for the mining of limestone were increased by 10% to incorporate the smaller companies that were not included in the sampling. It was understood that the rock mined by these companies was used largely for road base fill. Therefore, cement manufacture, concrete products manufacture and linked activities were not increased.

The sources for all data and parameters employed are identified when those data or parameters were introduced.